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Blog links as pipelines to buzz elsewhere: the case of New York theatre blogs

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Abstract

The concept of buzz is both new and heavily contested. One of the strongest debates about buzz is the possibility of ‘virtual buzz’ or buzz that takes place online. At the heart of this debate is the importance of real-time, face-to-face contact. To investigate virtual buzz we present a study of a network of weblogs, or blogs, which share a topical focus on the New York City theatre scene. Using social network analysis, we find that these blogs exhibit a dense network of interlinkages between each other, with no dominant blog controlling the discourse. We believe this to be indicative of a buzz-like environment. We conclude by discussing the advantages that the study of blogs has for the field of economic geography.

1 Introduction

How knowledge is shared across space remains a vexing problem for social scientists. Flows of knowledge are important to economic and social change, as ideas, innovations, designs and social trends can be conceived as flows of knowledge. Some types of knowledge are more mobile than others, often couched in terms of tacit and codified knowledge, yet this dichotomy is incomplete (Balconi et al, 2007).

A key dimension of the literature on knowledge flows focuses on the advantages of agglomeration. By clustering people in close proximity, it is argued, large cities optimize opportunities for people to interact and to exchange knowledge face-to-face.

We provide empirical support for the distinction made recently by Asheim, Coenen and Vang (2007) between buzz and face-to-face knowledge exchange. In particular, we illustrate the ability for buzz to be transmitted electronically, providing key inputs to creative activity. The example is of theatrical workers in a medium-sized city monitoring several blogs that report the theatre scene in New York.

2 Local buzz and pipelines to buzz elsewhere

As research in economic geography began to take learning and flows of knowledge into account, to explain why some places are more innovative and therefore more successful, the focus was on localized learning (Maskell and Malmberg, 1999). Firms in a local area are simply more able to benefit from agglomeration advantages, such as

density of contacts and opportunities for the richer, more fruitful face-to-face contacts. This “buzz”, the interaction that generates creativity, is found to varying degrees in all urban centers. *Buzz*, as Storper and Venables (2004) define it, incorporates the conditions of knowing what is happening and intentional face-to-face contacts, as well as the unintentional “rubbing elbows” or the force of “being there” (Gertler 2003). Asheim et al. (2007) clarify the distinction between face-to-face contact, needed for one-on-one interaction, and buzz, which provides “group-based self-generating exchanges of information and knowledge outside formal collaboration” (Asheim et al. 2007: 658). Importantly, Asheim et al. suggest that buzz can be transmitted both electronically and face-to-face, and therefore can be both local and global. Bathelt and Schuldt (forthcoming) are more pessimistic at the possibility of what they term *virtual buzz*. Existing online collaboration platforms, they write, do not allow for the constant, immediate feedback through conversation that face-to-face contact does. Buzz is considered crucial for knowledge exchange in the creative industries as they draw on highly tacit knowledge that depends on local context, frequently aimed at organizing for projects. Creative regions are creative because their mix of innovative actors and clusters of creative people generate greater buzz than is found in less creative places (Schoales, 2006).

Buzz and localized learning in knowledgeable clusters, in turn, generate “spatial knowledge monopolies” which firms from elsewhere can tap only by locating there (Cooke, 2005). Spatial knowledge monopolies are based on more than only local buzz. They also reflect a variety of unique networks – both local networks of local industrial knowledge (Maskell et al, 1998; Henry and Pinch, 2000) and networks (or pipelines) to global knowledge (Bathelt et al, 2004). As a result of spatial knowledge monopolies, “firms become co-identified with regions in terms of their respective profiles of technological specialization” (Cantwell and Santangelo, 2002, page 187). Prominently, co-location and proximity are now viewed as a means of learning and perhaps even essential for learning (Gertler, 2003; Storper and Venables, 2004).

The learning processes that take place among actors who are embedded in a community and who benefit from “buzz” effects are distinct from the knowledge attained by investing in building channels of communication – pipelines – to selected providers located outside the local milieu. The co-existence of high levels of buzz and many pipelines can provide firms located in outward-looking and lively clusters with a string of particular advantages not available to outsiders (Bathelt et al, 2004). The “pipelines” are not only digital networks; they also critically include air travel for face-to-face interaction. People “remain the containers for shipping complex uncodifiable information”

(Leamer and Storper, 2001, page 648). It is important to note that proximity need not be permanent, as seen in the temporary clustering at trade fairs, exhibitions, conventions, congresses, and conferences (Maskell et al, 2006).

Over time, mainly through mobility of workers, firms in a cluster tend to develop a cluster-specific, inter-firm stock of knowledge that is distinct from that anywhere else in the industry. Knowledge flows across cluster boundaries are minimal and these reflect a combination of both local networks of local industrial knowledge and networks (or pipelines) to global knowledge.

How can we measure “buzz”? How can we measure the degree to which some actors are more “plugged into” that buzz than other actors? A possible example is found in the work on interfirm networks. Even a relatively simple network, of the firms with which a single firm is linked along with their interlinkages, can result in a complex diagram, with identifiable sub-networks that are interconnected to different degrees. This is the case with the alliances of the firm, Texas Instruments (TI), which has research and development (R&D) alliances with dozens of companies around the world. Although TI has links with firms in many countries, relatively few of its allies in the USA themselves have international alliances (Narula and Duysters, 2004).

A better example is the set of links – for business and knowledge purposes – of firms in local clusters. Giuliani’s (2007) work on three wine clusters displays brilliantly that inter-firm links do not encompass all firms; some are isolates. Moreover, among inter-linked firms, it is possible to identify two groups of those that are linked: an advanced and a laggard faction in one case, and firms in a core and those in a periphery in the other case. We will see whether the set of 48 New York theatre blogs displays any of these interlinkage patterns.

3 Blogs as pipelines, blogs as networks

Automatically-updating and self-formatting personal webpages, known as weblogs or blogs, are a new force in Internet communications that is currently creating reverberations in the political, social and economic spheres of the developed world. While in theory the first weblog was created by Tim Berners-Lee, the founder of the World Wide Web as we know it, blogs have come into force only since around 2002 (Herring et al, 2005). Blogs represent a way for individuals of any technical caliber to create an attractive, easy-to-read website that can be readily followed by an audience. Technorati, a blog search engine, currently tracks over 112 million blogs, with approximately 30,000 added daily.

Because of their perceived cultural impact, blogs have been the subject of a good deal of recent academic interest. The first goal of research into blogs is how to separate out blogs from other web sites such as personal home pages or news pages. Winer (2007) defines a weblog as a “hierarchy of text, images, media objects and data, arranged chronologically”. In this definition, the important factor defining a blog is that it is a reverse-chronologically ordered series of texts. However, this definition is problematic, because it includes many websites that (1) predate the conceptual creation of blogs and (2) are not considered blogs by their creators. An example is the popular technology site slashdot.org, a news website with chronologically-ordered news articles with attached user comments. Under Winer’s definition, this would be considered a blog, despite the fact that slashdot’s creation predates blogs and its creators and users do not consider it to be one.

A better method for delineating blogs from non-blogs is to define blogs as those created through blogging software. Blogging software are programs, usually stored on a public Internet server, which allow the easy updating of webpages, the automatic construction of archives and a system to personalize and visually format the webpage. Popular examples of blogging software include Livejournal, Blogger and Wordpress. Boyd (2006) disagrees with this, saying that defining blogs based on the technology they use mistakes the structure of the medium for the medium itself. Boyd delineates blogs from static webpages by the fact that blogs capture ongoing expressions. Blogging should be understood as a practice, not a medium. However, defining blogs based on the software used to create them allows for a simple test to separate blogs from other types of webpages. This is a heuristic and should be understood as such.

The creation of typologies is a second major theme in the literature on blogs. Blood (2002) proposes a three-part typology: filters, personal journals, and notebooks. Filters are blogs that scan other websites for topical content and aggregate it for readers. While this type of blog is usually the most read and commented on by the popular media, filters make up only a small minority of the total blog population (Vigas, 2005). Personal journals are blogs aimed at publishing the author’s personal thoughts and opinions in a diary-like format. Finally, notebooks are sites which feature longer essays on a specific range of topics. Table 1 summarizes these definitions. In our discussion of New York theater blogs, we use Blood’s typology to separate blogs into different categories for analysis.

Boyd (2006) again disagrees with this conceptualization. She believes that by placing the typology of blogs in the discourse of print-based communications, we force new methods of communications into older molds. For

instance, when we place a blog into the diary-like 'journal' category, we implicitly make diary-like assumptions about the goals of the blog, such as that it is a private journal of one's thoughts. However, blogs are explicitly a public forum for communication. When defining blogs, Boyd suggests, we must avoid segmenting them into genres based on previous communication norms.

Blogs can be further delineated by several other characteristics. Bar-Ilan (2005) discusses four different ways to categorize blogs: content, format, authorship, and purpose. Content refers to the topics on which the blog concentrates on, such as personal subjects, business topics, or technology topics. Format refers to the above-mentioned blog types, though Bar-Ilan (2005) gives them different names. Blogs can have either a single author or multiple authors. Blogs may also have one of several purposes and potential audiences, ranging from family and friends to potential clients or other segments of the Internet population.

Finally, we can also examine blogs for common properties that can be studied. Each post in a blog has three common elements: a permalink or permanent web address, a date/time when it was posted, and a title (Anjewierden et al, 2006). More recently, the phenomenon of 'tags' has emerged. Tags are small text snippets that can be used by the author to categorize a post into any number of different topics. They allow the author to quickly show what the post is about and allow readers to view all posts, or individual blog entries, of a certain topic (Godwin, 2006).

3.1 Networks of blogs

What makes blogs more interesting than traditional personal websites are the networks that they form. Blogs link to one another in three ways. The first is through links embedded in individual posts. These links are usually to other posts in other blogs and are used to either begin discussion or to illustrate arguments. Secondly, blogs will also post what is known as a *blogroll*: a sidebar listing several sites that the author(s) read on a regular basis. The final way is through what are known as *trackback* or *pings*. When blog A links to a specific post in blog B, the blogging software of A informs blog B that it is being linked to, and an excerpt of blog A's post is placed in the comment sections of the post in blog B being linked to. This allows the author of blog A to see who is talking about his or her work. Links between blogs create networks, and these networks represent social networks that provide spaces of sociability, information exchange and a sense of belonging (Wellman, 2001).

Taken together, all the networks between all blogs are called the *blogosphere*. This network is made up by blogs that link to each other. Within the blogosphere, separate and distinct networks are detectable. Mostly, these

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networks are differentiated by topic. Technology blogs will most often link to other technology blogs, not to sports blogs (Ornes, 2007). These links between blogs can be conceptualized as knowledge linkages between blog authors (Anjewierden et al, 2006).

However, the nature of these links differs depending on the type of blog. Filter blogs will post links on many different subjects and act as aggregators for a wide range of different websites, including other blogs and more traditional websites. Other blogs will link to filters frequently, as they use them as scanning tools to gather information and knowledge. Notebook blogs will have fewer external links per post, but will place them in greater topical context by writing a more in-depth blog entry. Personal journal blogs will link mainly to the authors' friends, and will thus be less embedded into the blogosphere.

Links between blogs have been used in previous research to study flows of knowledge between places (eg Lin et al, 2007). While there are problems with using links in this nature – not all links are used in the same way for the same purpose and may not denote actual knowledge networks – by and large these links are an adequate proxy for knowledge flows.

Previous studies, however, have failed to account for the particular nature of blogs. In traditional social networks, the only actors participating in the network are the ones who actively communicate. For instance, in a business network, only those who interact directly with others are studied. But blogs have both writers and readers. The knowledge networks of the readers are constrained by the link choices of the writers. But, we must also remember that the writers are themselves readers too. Their knowledge networks are shaped by the blogs that they read, as evidenced by their blogroll. Blog networks therefore represent backwards and forwards knowledge linkages between writers and the blogs that they read.

The information that blogs present to their readers - gossip, rumors, speculation and analysis - represents one among many knowledges about a particular subject. Bloggers, and indeed anyone involved in a particular community, receive information from multiple sources in both the real and virtual worlds. Within a large community such as the New York City theatre scene, there exists a large pool of information in the form of "back channel" communication consisting of virtual, non-public channels such as e-mail and instant messaging. Blogs are an important, very public form of virtual buzz but do not constitute the entirety of virtual buzz. While it is impossible to quantify the exact importance of blogs within the buzz of a community, they are of special interest to researcher because their public and networked nature allows for in-depth study.

3.2 The case for theatre blogs

Theatre is an industry that is exemplary of these knowledge networks, given that it is a creative profession in which new ideas and trends change rapidly. Those professionals who wish to remain at the forefront of the newest trends in the industry must have convenient access to current buzz. “No market relies more heavily on social networks than the exchange of cultural goods – like fashion, art, and music. Cultural industries and their products are driven by taste rather than by performance” (Currid, 2007a, page 77). Blogs are a means of communicating taste to others in other places. Moreover, theatre is unique among other cultural industries because of its persistent attachment to New York City as the preeminent capital of artistic innovation and administration. With 41 Broadway theaters and 94 Off-Broadway theaters, New York maintains the highest absolute number of professional theaters of any city in the United States (New York City Theatre, 2008). Additionally, New York serves as the headquarters for professional organizations such as the League of Resident Theatres and Theatre Communications Group, as well as labor organizations such as Actors’ Equity Association and the International Alliance of Theatrical Stage Employees.

Actors, directors, and writers from all over the world are drawn to New York because of the creative benefits associated with this urban agglomeration (Currid, 2007b). In other words, “Not to know New York is to remain apart, to some extent, from the soul of the American stage. ... New York is an easier place to connect with a real theatre scene. ... Theatre bars, theatre bookshops, theatre lobbies, cheap ethnic restaurants on Eighth Avenue, and the TKTS line in Duffy Square ... all abound with [theatre professionals]” (Cohen, 1998, pages 69-70). Thus, those who do not live in New York but who still wish to tap into the buzz generated by the theatre professionals who work there can do so by reading the blogs of those professionals. Blogs have an advantage over traditional media in that they can be more informal and, consequently, more candid than articles published by *Variety* or *Back Stage*. Blogs allow readers a first-hand, inside look at artistic and business practices occurring “in the trenches” of professional New York theatres as they are occurring. Not limited to professionals alone, patrons of theatre can publish reviews of shows in their blogs, thereby usurping a degree of authority from the critical establishment.

In this way, Internet users who do not live in New York can still tune in to the buzz occurring among theatre artists who do live there, informing and enriching their own work. Furthermore, by commenting on New York blogs or creating blogs of their own, they contribute to and build upon current debates and discussions, linking

themselves into this networked exchange of specialized knowledge. We chose the website Theatreforte (www.avltheatre.com/forte) as the site from which we gathered our list of 48 New York theatre blogs. Recognized for its “massive New York theater blogroll” (Del Signore, 2007), Theatreforte is a filter-type blog that aspires to collect and aggregate RSS¹ feeds from every English-language theatre blog published around the world. It represents a comprehensive and inclusive assemblage of all theatre-related blogs currently being published.

4 Research methodology

Due to the hyperlinked nature of the Internet, social network analysis is a particularly powerful method for analyzing linkages between webpages. This is especially true for blogs, because of their propensity to link to other blogs talking about similar subjects. We can conceptualize these links between pages as examples of knowledge flows (Anjewierden et al, 2006). When a variety of different knowledge flows combine together, they create an *ecology of buzz*, one in which knowledge acquisition is an automatic and costless function of existing in the environment.

Data are gathered regarding blog networks through a process of ‘crawling.’ Crawling is a method used by all major search engines, such as Google and Yahoo!, and the blog searcher Technorati. In essence, a web crawler is a computer program that interactively examines a webpage for all the links in it. It records these links and then performs the same process of recording links at these. This process is illustrated in Figure 1. A web crawler, starting at site A, finds a link (the arrow) to site B. At site B, two links are found to C and D. The crawler then follows the link from C to E - along with indexing D - producing a complete record of the link network of the sites. By keeping track of which pages are interconnected, a detailed network of linkages can be easily constructed.

For this study, the [issuecrawler.net](http://www.issuecrawler.net) (www.issuecrawler.net) crawler was used. A list of 48 New York City blogs from Theatreforte was seeded into the crawler. This crawler examined two levels of each of these sites: the main page and pages that the main page linked to. Most commonly, the second level includes pages of archived posts. We recorded all links to outside sites from both these levels. Of the 48 blogs seeded into the crawler, 9 could not be crawled. This is due to a site’s creator having placed a file on the blog that restricts the use of crawlers, in order to prevent search engines from indexing their content or to reduce bandwidth. While the ethics of academic webcrawling are still being debated within the community, researchers must abide by notices placed on web servers

¹ RSS, or Real Simple Syndication, is a technology that allows users to be notified in near real time when a webpage is updated.

by the owners specifying that their sites are not to be crawled (Thelwall and Stuart, 2006). Academic web crawlers are very sensitive to restrictions that the authors place on the use of their site and take a very conservative stance on when it is allowable to crawl a website. This means that research based on web crawling will often underestimate the number and density of links between sites.

Because there is no standard design and layout of blogs – different blogging software have different designs and most allow the user to modify them – it is impossible to separate the links in the sites' blogrolls from other links in the text of posts. Not all sites use blogrolls, and some sites only have them appear on the main page, while others are placed on all pages within the blog. Using existing webcrawling technology, it is not possible to identify and segregate links from blogrolls as opposed to links that are within the text of a post. For this reason a valued matrix of connections – where the cells of the matrix record the total number of links between blog i and outside page j – is misleading because some blogs' outlinks will be inflated by the presence of the blogroll on all of the site's pages. We compensate for this by converting the valued matrix into a binary matrix. In a binary matrix, a '1' is recorded if there is at least one link between site i and j , otherwise a '0' is recorded. This methodology does not allow for an analysis of the *strength* of knowledge flows between sites, but it does allow a much more complete analysis of the *presence* of these knowledge flows.

The crawling process created a directed graph, meaning that the amount of a site's inlinks – links directed to it from other sites – are often different from its outlinks – the number of links to other sites originating from it. This is because outlinks (links from blog A to another site) are fundamentally different from inlinks. Outlinks are essentially costless to create, requiring the author only to read something s/he finds interesting and linking to it. Inlinks (links from another site to blog A), however, require that the author actually create content that others find interesting. This can be done in one of two ways. The first is to present information of which others are not aware. In the context of theatre blogs, this might be rumors about the opening of a new show or about negotiations between theater owners and actors' unions. This new information can be obtained through personal experiences, gossip from friends and colleagues, or by the blog author reading a wide array of other blogs. Writers can also write in-depth commentary on information already available, representing a process of knowledge creation from the combination of preexisting information. Others link to the post in order to comment on the commentary.

In order to generate inlinks, the authors must provide original content that others find interesting. On the Internet, inlinks are an important source of credibility. They drive viewers to the blog and increase the site's position

in search engine results². Outlinks are free to create, but serve an important purpose. One of the major features of blogs, as opposed to other types of web pages, is their hyperlinked nature. It is seen as customary to link to whatever document a writer is discussing, and if the writer found the content through an intermediary, such as a filter blog, to also provide a link to that blog as a 'hat tip'. These practices combine to form an *economy of links*, with valued content being rewarded with inlinks, which increase the author's prestige and, if they have set up advertisements on the site, revenues. In some cases, if the author's prestige rises sufficiently high, s/he is rewarded with free promotional gifts from those looking for publicity. In the context of the New York City theater scene, these could be free tickets to a show's opening. A blog's prestige results from it providing a service to its readers. For filter blogs, this service is collecting and presenting news and information from a variety of different sources. For journal and notebook blogs, this service is providing new content through their own experiences and interpretations. For these types of blogs, the blog gains respect based on the novel knowledge it contributes. Older blogs gain prestige because they have a known track record and are often privy to non-public information through their contacts³.

Based on the crawl, performed in July 2007, the 39 blogs indexed linked to 108 distinct websites. From this, we constructed two social network matrices, one with the total 108 websites and a second, more restricted network, with just the connections between the 39 seeded blogs that were crawled. The average distances of the nodes – the average shortest path between one node and all other nodes – is 2.475 in the full matrix and 2.12 in the restricted one. This suggests that there are more direct connections between blogs in the restricted network, meaning that knowledge is more accessible for the writers of the seeded blogs than the writers' of blogs outside of the restricted network. We see a further difference between the two graphs in their density, the proportion of actual links to the theoretical maximum. The full graph has a density of .0831, while the restricted graph of only selected theater blogs has a density of 0.1525, nearly double that of the full graph. This means that the connections *between* theater blogs are much denser than the *outside* connections to non-theater blog sites.

In order to further examine the restricted network of theater blogs we broke the 39 blogs into two categories: a core and a periphery. To do this we used the *k*-core algorithm in the social network analysis toolkit

² Inlinks are also the primary metric for a site's Google Pagerank, which determine its position in Google search engine results. This, in turn, has a dramatic influence on the readership of the blog.

³ Older blogs can of course be non-prestigious if they provide no services or new content to the reader. Since blogs are generally free, the only cost to produce them is the author's time and energy. However, if the author receives no encouragement from readers in the form of e-mails or comments, it is likely that the blog would eventually fold. That is, it is unlikely for a blog that adds no new content to the community will last a long time because it will garner no readers and no attention.

UCINET4 (Borgatti, Everett and Freeman, 2002). *K*-core is a method used to identify subgroups in a network based on the number of connections that one node has to other nodes (Wasserman and Faust, 1994). In total, our network generated 7 different *k*-core groups. Much like principal component analysis, the *k*-core analysis leaves us with numbers that we have to interpret arbitrarily, in this case by assigning the groups to either the core or periphery. We constructed several different models and decided on one that created a core and periphery of nearly the same size, containing 20 and 19 blogs respectively. The number of blogs and their average number of inlinks and outlinks are shown in table 2.

Figure 2 is a visual representation of the network. As can be seen in the figure, there are few linkages between the peripheral groups, which are instead connected through intermediary linkages to the core group. These linkages exist as outlinks from core blogs to peripheral blogs in different groups. Thus, readers of a core blog gain knowledge produced in peripheral blogs. Core blogs thus exist as concentrators of knowledge produced within the New York City theatre blog network. The number of inlinks to the core blogs suggests that many theatre bloggers are taking advantage of the unique knowledge properties of the core blogs.

By adding to this analysis Herring et al's (2005) blog typology of blogs – personal journals, filters, and notebooks – this pattern is confirmed. A majority of the filter blogs, those which create content by reading a variety of sources and commenting on the most interesting, are in the core group. There is a smaller proportion of personal journals and notebooks in the core than in the periphery. Filters thus become a core buzz-sharing medium for other bloggers. Instead of taking the time to gather information from a wide variety of sources, web-based and human-based, bloggers who write more in-depth articles can read filter blogs, learn what the issues of the day are, and analyze them using their own personal knowledge of the situation.

Only one blog, ArtsJournal (www.artsjournal.com), was completely cut off from the restricted network, with no links to or from the other selected blogs. ArtsJournal is unique in the sense that it is not strictly a theater blog, but a general arts and culture blog that serves as a “daily digest of arts, culture and ideas”. Also, ArtsJournal's blog – [ajblogcentral \(www.artsjournal.com/blogs\)](http://www.artsjournal.com/blogs) – has only these topics: culture, dance, media, music, publishing, and visual. That is, theatre is not among them. Furthermore, it is not restricted to only New York City culture, but has a more international perspective. Finally, while it is a filter, it gathers its links mostly from

4 While UCINET has a specialized core/periphery algorithm, it was designed for far larger networks than the one we are studying, thus our use of the alternative *k*-core method.

mainstream news sources, not other blogs. For these reasons, we can hypothesize that it does not produce content that other bloggers find interesting enough to link to.

Not only is this network dense enough that only one node is completely cut off, there are no structural holes in the entirety of the network. A structural hole is a node that serves as the sole link between two different portions of the network. If that node is removed from the network, the two portions are completely cut off from one another. We would expect to see the presence of structural holes in a hub-and-spoke network, with one central blog that links to, and is linked from, other blogs. Instead, we see a dense, redundant network. This is precisely the network we would expect to see in a buzz-filled environment: everyone talking to, and about, everyone else.

5 Conclusions

This paper has been among the few attempts thus far to unravel the structure of the portion of the Internet devoted to blogs – the blogosphere. Blogs are a particularly interlinked subset of the Internet, thus lending themselves to network analysis. The context we have chosen, blogs written by New York-area residents involved with the theatre scene, also represents a possible mechanism for people outside New York to tap into its unique buzz. Given the uniqueness of New York as a center for theatre and other cultural industries (Currid, 2007a; 2007b), blogs based there provide a useful window for those located elsewhere.

Our case study empirically shows the existence of “virtual buzz”. Blogs are not a full substitute for “being there”, given the “spatially bound creative chaos” found in New York (Currid, 2007a, page 111). Elbow-rubbing still occurs on the sidewalks of New York City, but that activity can now continue virtually during off-hours via blogging. Currid includes as “cultural gatekeepers” gossip columnists, fashion editors, and celebrity magazine writers; we would add bloggers to this set. All of them communicate to audiences in the New York area as well as outside of it.

The question remains: is the pattern that we described above buzz? It certainly bears the hallmarks of *repeated* interaction. These blogs frequently cite one another as sources of knowledge regarding the goings-on of the New York theatre scene. There is a record of *diverse* interaction. While no blog linked to all the other blogs, there was a greater than 95% chance that if a reader started at any blog, within two hops (that is, links to other blogs) he or she could reach any other blog. This was not because all the sites link to and are linked from a central hub blog, as

no central hub exists in this network. While everyone is not talking directly to everyone else, they *are* talking to someone who, in turn, talks to someone else.

What this network does not possess is the opportunity for real-time feedback that Bathelt and Schultdt (forthcoming) perceive as being vital for buzz. The real-time feedback allows a person to judge the validity of what someone is telling them. Ironically, though the Internet operates literally at the speed of light, blog communication is not in real time. Rather, it takes place over days and weeks as authors find the time to make a post about current events. What this network lacks in real time communication, however, it makes up in archived context. By this we mean that the archived nature of blogs preserves the context of discussion. All the primary documents and commentary are preserved for inspection. This partially replaces the real-time feedback component of buzz as a tool to validate knowledge.

A persistent problem in the study of buzz – and in the study of knowledge exchange in general – is the near impossibility of actually observing the interpersonal communication. Ethical restrictions, privacy concerns, and the difficulty of penetrating personal networks makes the observation and recording of communication between people difficult. However, blogs by their very nature record and preserve the communication process. Not only do blogs preserve the thoughts of the author, but the “comment” and “trackback” features available on many blogs preserve a record of responses to those thoughts.

In 1991, Kurgman bemoaned how knowledge flows leave no paper trail. The work of Jaffe et al (1993) on patents quickly proved him (at least partially) incorrect. However, patent analysis studies proxies of knowledge, not the knowledge itself. Methods enabling one to track and study actual knowledge flows have remained more elusive. Blogs present us with the opportunity to observe, in near-real time, the flows of knowledge and discourse between people. In addition to its suitability for quantitative analysis, blogs are also a rich environment for qualitative analysis because the history of discourse and authorship is preserved.

A tight knowledge network is formed by individuals participating in this blogging community. Moreover, this network is composed of a variety of blogs that exist on a more or less equal footing. This method of communication represents a powerful new forum, especially for the so-called “creative fields” where a knowledge of current trends continues to be a vital asset. The issue of bloggers who act as pipelines between distinct, but similar communities - such as between the New York and London theater scenes - is particularly ripe for future research. Such pipelines allow distinct, geographically localized networks of blogs to keep abreast of developments

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in other regions. Bloggers acting as pipelines for extra-regional knowledges face the challenge of translating non-local contexts to make them understandable to readers. Opportunities for future empirical research could look at pipelines to buzz occurring in other cultural industries and in other cultural capitals, such as Nashville's music scene or the Paris fashion industry. This will give researchers an opportunity to construct detailed networks of communication and observe this process of communication as it occurs.

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Table 1. Summary of blog typology

	Personal Journal	Filter	Notebook
Number of Links	Medium	High	Low
Focus	Personal	External subject	External Subject
Purpose	Tell others about author's life and thoughts	Identify and link to many different sources of information on a topic	In-depth discussion of a certain topic
Length of Posts	Medium	Short	Long

Table 2. Statistics on core and periphery blogs

	Core			Periphery		
	Total Number	Average In- Degree	Average Out- Degree	Total Number	Average In- Degree	Average Out- Degree
Personal Journal	9 (45%)	7.1	6.4	7 (36%)	3.14	2.71
Filter	7 (35%)	7.4	11.7	3 (15%)	5.0	1.66
Notebook	4 (20%)	7	13.8	9 (47%)	5.0	0.77
Total	20	7.2	9.75	19	4.31	1.63

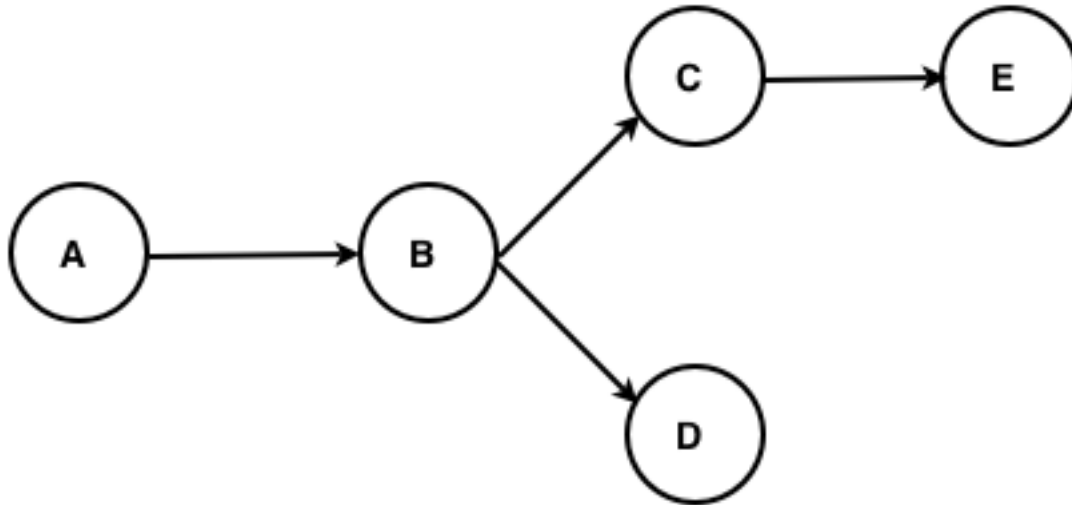


Figure 1. Sample web crawler network

Network Position